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Bluetongue

A Threat to U.S. Exports

United States Department
of Agriculture

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Bluetongue

A Threat to U.S. Exports

For about 30 years, bluetongue has blocked the export of U.S. cattle, sheep, and goats to many major world markets. Currently, these markets include Australia, New Zealand, and six European countries. Other countries may refuse our livestock in the future.

Canada accepts U.S. cattle, but has stiff testing requirements before the animals may cross the border.

Bluetongue is a virus disease of cattle, sheep, goats, and wild ruminants. It is particularly damaging in sheep, where up to half of infected animals may die. In cattle and goats, however, bluetongue primarily affects the animals' reproductive ability, so the disease and losses from it are not as readily identifiable.

Bluetongue is spread from animal to animal by biting insects. In the United States, the disease is most prevalent in the Southern and Southwestern States. It is almost nonexistent in the upper North Central and Northeastern States where biting flies do not appear able to transmit the disease.

Bluetongue causes inflammation, swelling, and hemorrhage of the mucous membranes of the mouth, nose, and intestines. Inflammation and soreness of the feet also are associated with bluetongue. In sheep, the tongue and mucous membranes of the mouth become swollen, hemorrhagic, and may look red or dirty blue in color, thus giving the disease its name—bluetongue.

Bluetongue was first recognized in South Africa in the late 1700's, but it was not until the early 1900's that it was described in detail. The disease was reported in Cyprus in 1943 and subsequently in Israel, Turkey, Spain, Portugal, Pakistan, India, and the United States. Bluetongue is most prevalent when flying insects are most numerous.

How It Spreads

Bluetongue virus has 20 serotypes. Only four serotypes of bluetongue virus have been found in the United States. Animals that have recovered from one type do not necessarily have immunity against other types. For immunization, the vaccine for the specific serotype of virus in the area must be used.

Insects are the principal means of transmission of bluetongue virus. Animals do not contract the disease from other animals by direct contact, although it has been shown that bluetongue virus can be transmitted from dam to fetus through the placenta and from bull to dam through semen.

The principal vectors, or transmitters, of bluetongue virus are small biting gnats of the genus *Culicoides*, sometimes called sand flies, biting midges, or "no-see-ums." These gnats are found worldwide in a variety of environments. They feed sometime between dusk and dawn, depending on the species of *Culicoides*.



A common transmitter of bluetongue is a gnat.



Swollen bluish tongue and lips give the disease its name.

Signs

The severity of signs in a bluetongue-infected animal depends on the strength of the virus type and the age and resistance of the animal. Lambs from ewes with an immunity to bluetongue may receive some immunity from their mothers. Older sheep, if susceptible, can become very ill. In some areas of the United States, where flocks are totally susceptible to bluetongue, the rate of illness may reach 100 percent. The death rate in such areas may vary from 0 to 50 percent, depending on the area of the country, the animals affected, and other factors.

The incubation period for bluetongue is approximately 1 week. The first sign is usually a rise in body temperature—up to 104°–107°F (40°–42°C)—which can last for 5 to 6 days. Some animals may show no other signs of illness, but most sheep and susceptible white-tailed deer and antelope do become obviously ill and depressed.



Severe inflammation of the nose may occur in cattle with bluetongue.



Sores often appear on the teats of nursing or milking cows with the disease.

Severe changes in the mouth usually are not apparent until 1 or 2 days after the start of the high fever. The soreness, swelling, and reddish or bluish discoloration of the mouth and tongue can be followed by erosions of the mouth, inner lips, tongue, and nostrils. These erosions can form raw sores and external scabs, which make it painful and difficult for the animal to eat.

The coronary band (tissue on the hoof similar to the "quick" of a fingernail) also may become inflamed, hot, red, and painful, resulting in severe lameness. Some sheep may stand with their heads and necks twisted to one side and their backs arched. Others may be unable to rise to their feet. Severe swelling of the face and jaws, which may extend to part of the neck, also has been reported. Redness of the skin, usually around the face and ears, is common and may extend to the entire body.

Bluetongue disease is not severe in cattle; less than 5 percent of adult animals usually show signs of disease. Calf production, however, can be seriously affected.

When clinical illness does occur in cattle, it is similar to bluetongue in sheep, including foot lesions, which could lead to confusion with foot-and-mouth disease. Bluetongue in cattle also closely resembles or may be identical to a cattle disease in parts of the United States known as "mycotic stomatitis."

Goats are more resistant to bluetongue than sheep or cattle. However, some cases of disease in goats with symptoms resembling those in sheep have been reported, and bluetongue virus has been isolated from goats.

White-tailed deer and pronghorn antelope in the United States are affected much more severely than cattle and often even more severely than sheep. In deer and antelope, the mortality rate can be extremely high. Bluetongue symptoms in white-tailed deer are identical to epizootic hemorrhagic disease (EHD).

Post-Mortem Lesions

The most obvious lesions seen on post-mortem examination are a result of the clinical signs that occur in the membranes of the mouth, nostrils, and skin. These consist of inflammatory congestion, multiple hemorrhages, reddish or bluish discoloration, swelling, erosion, and sloughing of membrane surfaces and discharges.

Congestion and hemorrhage also may be observed in mucous membranes of the heart, digestive tract, lymph nodes, liver, kidneys, and muscles.

Death of the papillary muscle of the heart is one of the most consistent and specific post-mortem lesions observed in some clinical cases.

In addition, lung congestion, swelling, and pneumonia are observed in some animals. Secondary pneumonia is the most common cause of death in the United States.

When to Suspect Bluetongue

Bluetongue should be suspected when a number of sheep or cattle show several of the following signs:

- Depression with heavy breathing or panting;
- Fever;
- Superficial hemorrhages or open sores on the tongue, mouth, or nostrils;
- Redness of the skin of the face, neck, and possibly body;
- Lameness accompanied by an engorged reddish-blue area around the base of the horns and on the coronary bands of the feet;
- Loss of condition and muscular weakness;
- Loss of wool;
- Congenital defects in lambs or calves;
- Abortions.

Prevention and Control

Although only four serotypes of bluetongue virus exist in the United States today, it is very important to prevent the entry of additional types, some of which are much more serious. The U.S. Department of Agriculture works to prevent new types of bluetongue virus from entering the United States by controlling the entry of susceptible ruminants from other countries where bluetongue exists.

Livestock owners in bluetongue-infected areas of the United States can help protect their herds from bluetongue virus by:

- Keeping animals indoors at night, especially at dawn, during peak seasons for night-flying insects;
- Keeping flocks or herds away from areas where biting insects are numerous;
- Moving animals to higher altitudes during insect seasons;
- Eliminating breeding areas for the *Culicoides* gnats;
- Vaccinating sheep with an appropriate vaccine.

What Can the U.S. Livestock Owner Do?

You, the livestock owner, are the first line of defense against the introduction of new types of bluetongue virus. To help prevent any such introduction and to help control and eliminate bluetongue in the United States, you should inspect your flock or herd frequently for suspicious signs and report any such conditions immediately to your local veterinarian or to State or Federal animal health officials.



Affected sheep may stand with arched back and appear sore footed and depressed.



The tongue and mucous membranes of the mouth become bright red and swollen 3 to 5 days after the onset of fever.



Swelling of the muzzle and salivation are early signs of the disease. At this stage, sheep usually have a fever and virus may be circulating in the blood.



The hoofs may become inflamed. A red line appears around the coronary band. Lameness may be severe.



This sheep is recovering. The lesions on the muzzle are healing.



The tongue of deer affected with bluetongue is swollen and inflamed.